

AESOP 3.0 Highlights

Afloat Electromagnetic Spectrum Operations Program



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What is it?



A Comprehensive Integrated Afloat Spectrum Planning Tool

- ✓ Radar and Combat System Frequency Planning
- ✓ Communications Planning
- ✓ Minimizes EMI Among ALL Afloat Emitters
- ✓ Automated Information Flow of Spectrum Planning
- ✓ Automated Frequency Assignment Generation
- ✓ Analysis of EMI Involving SG and Shore Based Emitters
- ✓ Complete Deployment Frequency Plans and Operational Guidance
- ✓ Compliant with Navy Certification and Messaging Standards
- ✓ Version 2.1 delivered in October 2008

*Mandated by ALCOM 33/05,
ALSECONDFLT 18/04 / ALTHIRDFLT 06/04*

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Spectrum Planning Tools



OP-3840 Technical Manual and Appendix F

Update!
Check the SIPR website for updates to the Database, OP-3840 Appendix F, and Standing Plans.

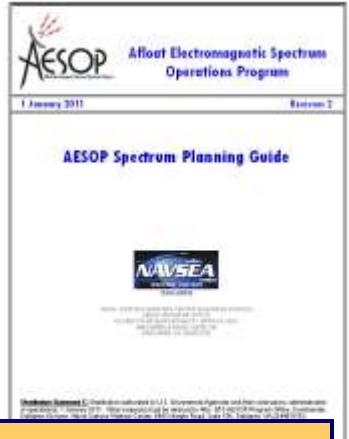


AESOP Info Sheet

AESOP Team



AESOP Software



Spectrum Planning Guide



Ship Card



SIPR Web Site Resource Updates

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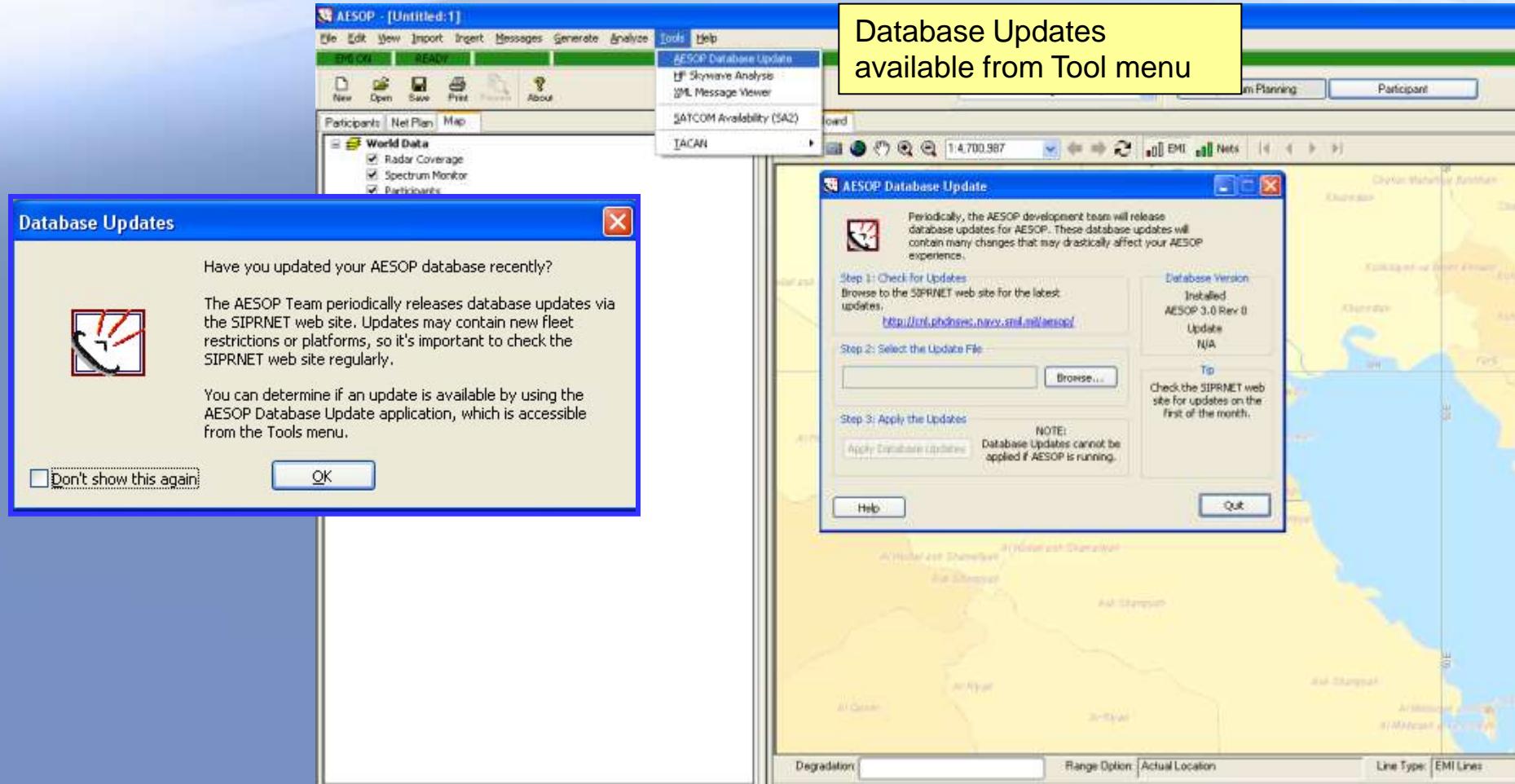
Restrictions & References

Afloat Electromagnetic Spectrum Operations Program

- ✓ Database Update Tool
- ✓ Positions of Intended Movement (PIMs)
- ✓ Joint Restricted Frequency List (JRFL)
MCEB Pub 8, Version 2.0.1 (1 July 2010); Tactical Information - JRFL
- ✓ Enhanced Mapping Capability
2-D and 3-D maps with Digital Terrain Elevation Data (DTED)
- ✓ Enhanced Radar Coverage Plots
- ✓ Comm Link and Net Connectivity Analysis
- ✓ Net View and Planning Board Graphics Enhancements
- ✓ Database Updates (Radar & Comm Equipment, Fourth Fleet AOR, CREW devices, Trucks, Manpacks, and UAVs)
- ✓ Expanded Net Restoral Plan
- ✓ Updated Standing Communications Plans (Commercial Broadband Satellite Program (CBSP) usage and SATCOM downlink, uplink, and rider usage, emission designator encrypted/unencrypted info)
- ✓ TACAN Scheduler

AESOP 3.0 Spectrum Planning Component

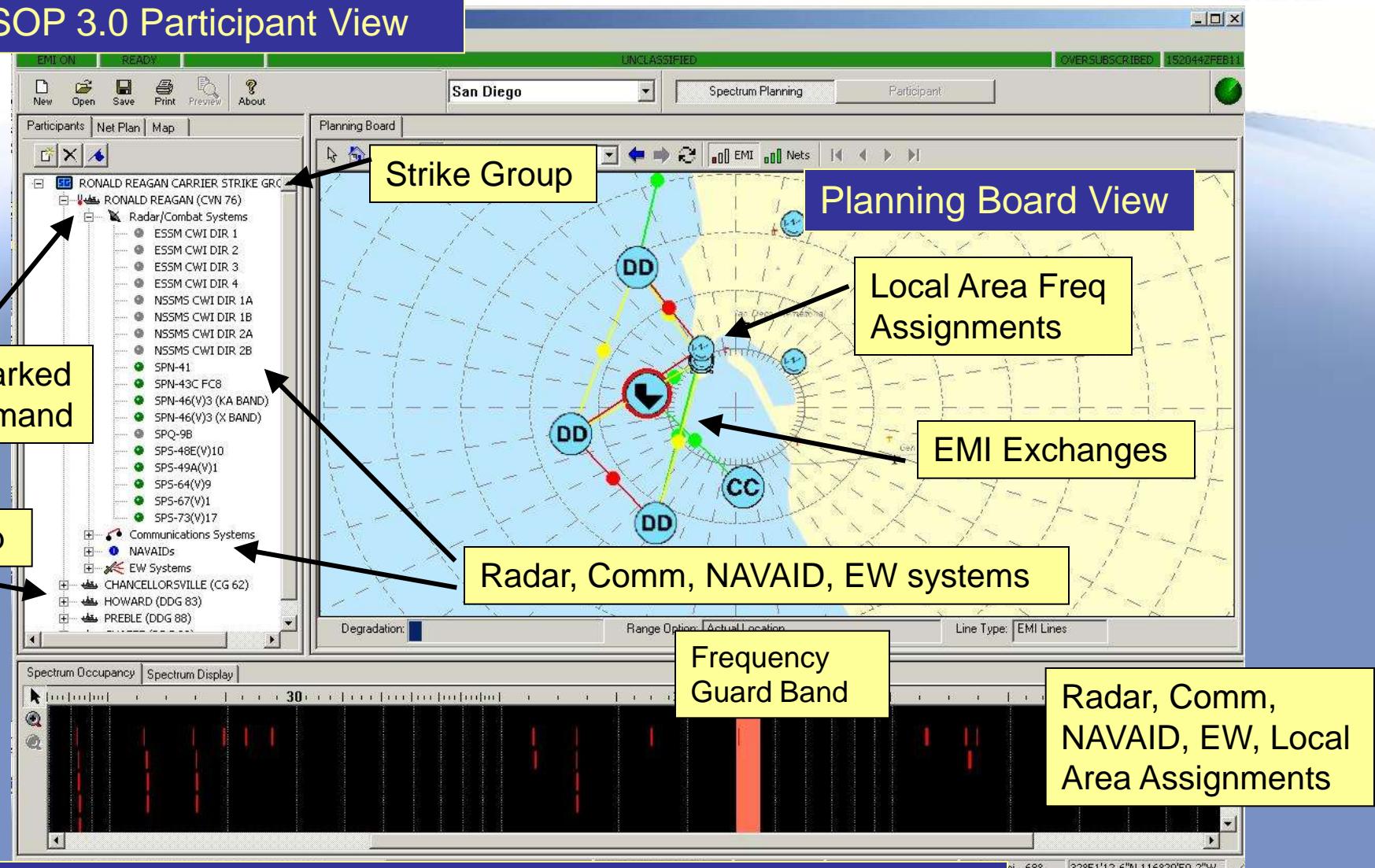
AESOP 3.0 prompts the user to check the SIPR website for database updates



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AESOP 3.0 Spectrum Planning Component

AESOP 3.0 Participant View

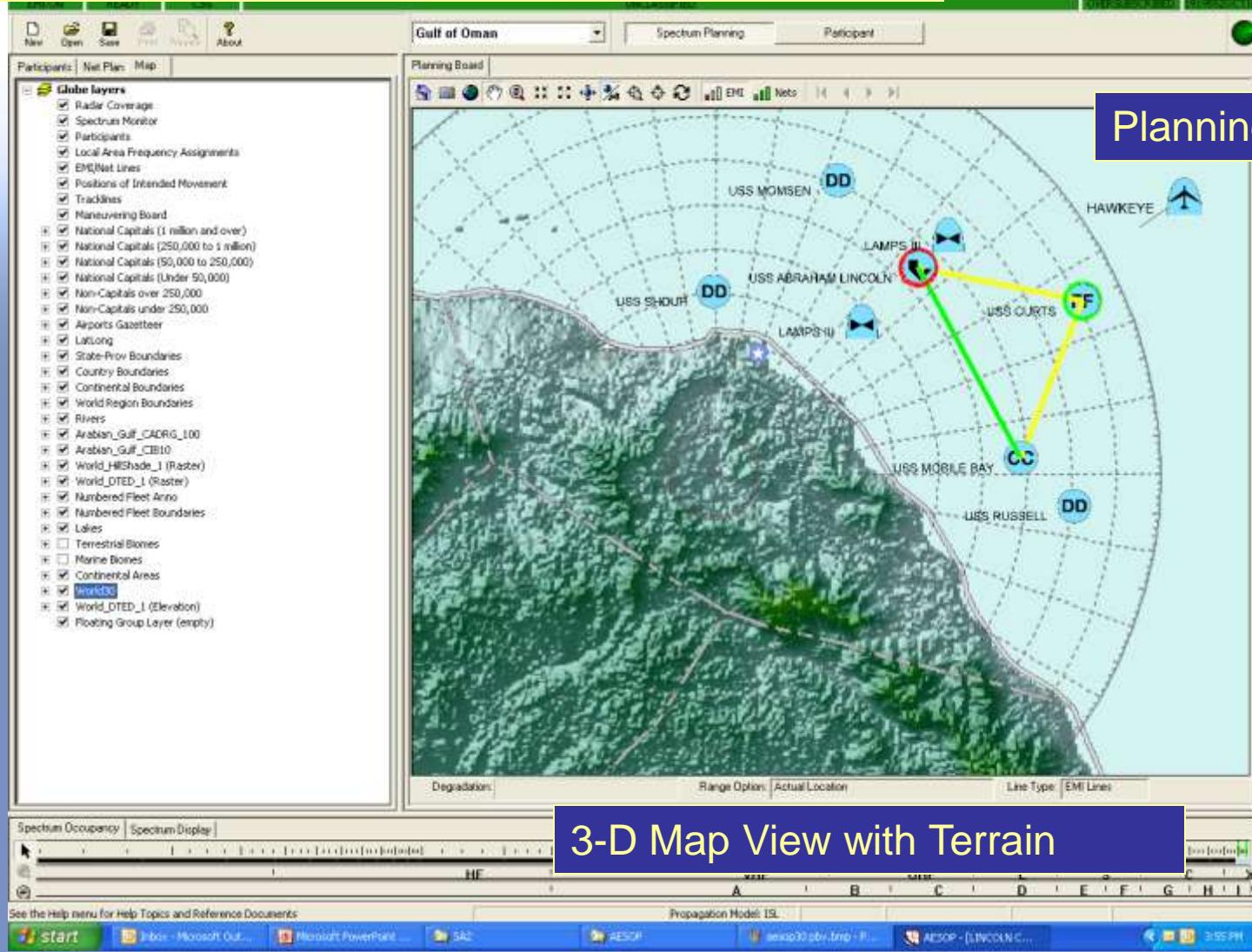


AESOP 3.0 Spectrum Occupancy View with International Taboo List Frequencies

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AESOP 3.0 Spectrum Planning Component

AESOP 3.0 Map View – Select layers and features



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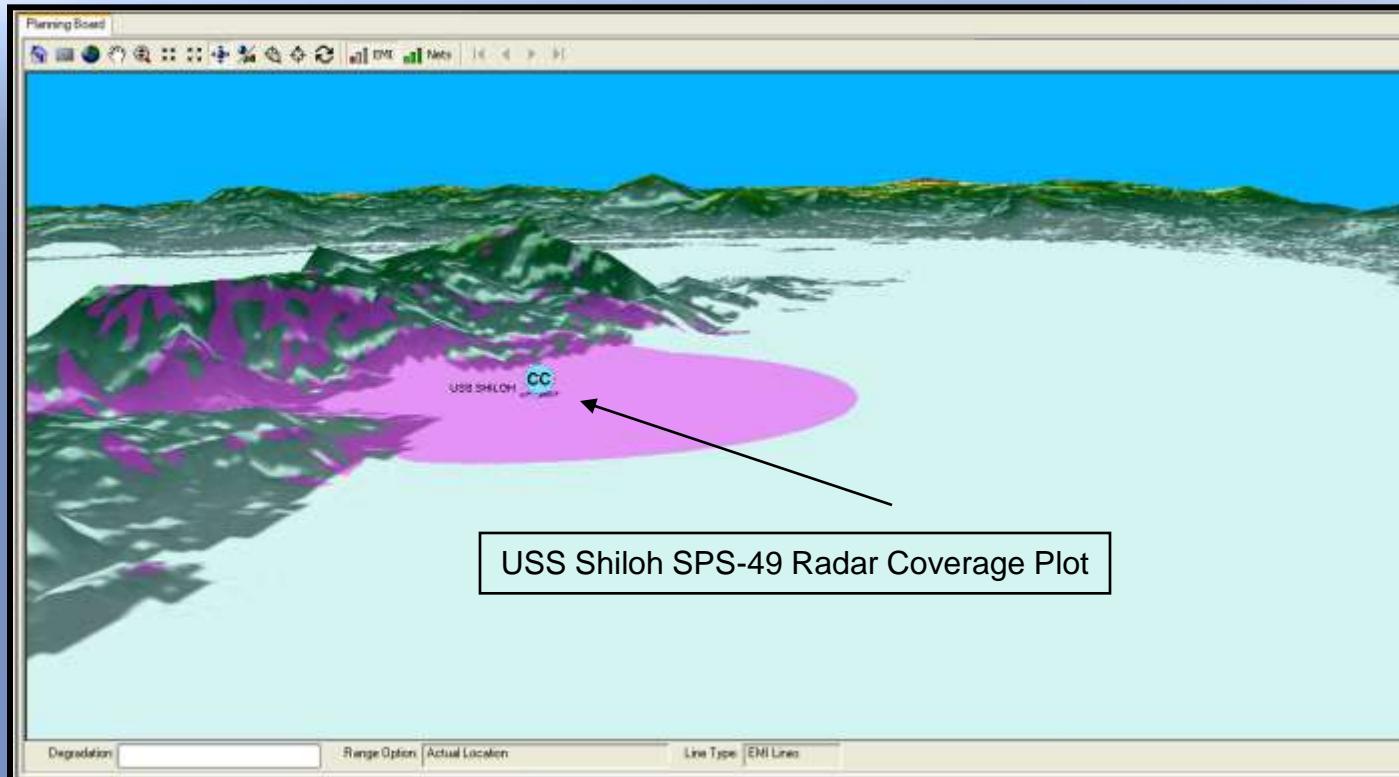
AESOP 3.0 Spectrum Planning Component



Map View

AESOP 3.0 Draped Radar Coverage Plot using Advanced Propagation Model (APM) and DTED data

Planning Board View



3-D Map View with Terrain

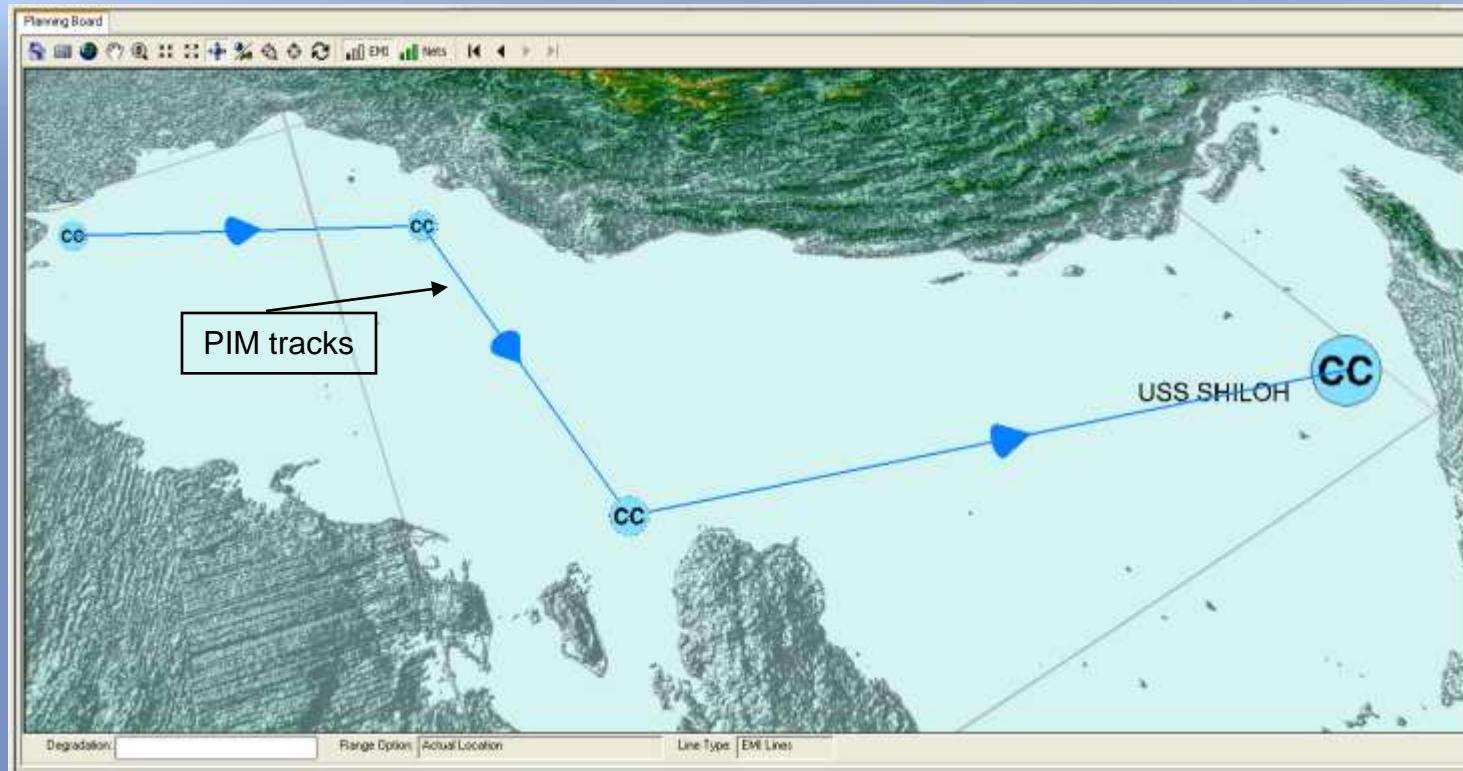
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AESOP 3.0 Spectrum Planning Component



AESOP 3.0 Position of Intended Movement (PIM) Tracks

Planning Board View



3-D Map View with Terrain

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AESOP 3.0 Spectrum Planning Component



AESOP 3.0 Nets View Indicators

Oversubscribed Comm Net and Net Connectivity Indicators

Planning Board View

Oversubscribed Comm Net Indicator

Spectrum Monitor

Net Connectivity Lines for Selected Net

Spectrum Display View

Frequency Guard Band

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See the Help menu for Help Topics and Reference Documents

Propagation Model: ISL 9072.50 MHz 347.2 nm, 199° 24°30'19.57" N 90°51'16.6" W

start media support Safety check OF-3940 (Rev 1) Microsoft Power 52 CBSF - Google AESOP - LINC 2:58 PM

AESOP 3.0 Spectrum Planning Component

AESOP 3.0 Net View – Net and Link Analysis

FP 158 Link Connectivity Analysis between CVN 72 and DDG 59

Platform	Transmitter	Platform	Receiver	Link Margin (dB)
CVN 72	VRC-54 NO. 2	DDG 59	VRC-46 NO. 2	5.794
DDG 59	VRC-46 NO. 2	CVN 72	VRC-54 NO. 2	4.194

Link Details: This link is not affected by EMI. Link distance is 52.326 nm.

Power/Sensitivity: Received power: -112.257 dBm, Receiver sensitivity: -118.041 dBm.

FP 158 Net Connectivity Analysis for all ships guarding the net

FP 158 Net Connectivity Analysis between CVN and DDG

Net Summary

- Worst link status: Bad
- Over-subscribed platforms: CVN 72, DDG 59
- Good links: 2
- Fair links: 3
- Poor links: 3

The systems below are being used to guard the selected Net. The predicted level of net connectivity (good, fair or poor) is indicated by the color of the link.

Platform	Transmitter	Platform	Receiver	Link Margin (dB)
CVN 72	VRC-54 NO. 2	DDG 59	RT-1747 NO. 6	0.549
CVN 72	VRC-54 NO. 2	DDG 59	VRC-46 NO. 2	5.794
CVN 72	VRC-54 NO. 2	DDG 99	RT-1747 NO. 4	-3.093
CVN 72	VRC-54 NO. 2	DDG 99	RT-1747 NO. 2	4.194
DDG 59	VRC-46 NO. 2	CVN 72	VRC-54 NO. 2	4.194
DDG 59	VRC-46 NO. 2	DDG 99	RT-1747 NO. 6	-0.200
DDG 59	VRC-46 NO. 2	DDG 99	RT-1747 NO. 4	-3.362

Link Details: This link is not affected by EMI. Link distance is 46.771 nm.

Power/Sensitivity: Received power: -107.451 dBm, Receiver sensitivity: -109.000 dBm.

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AESOP 3.0 Spectrum Planning Component

AESOP 3.0 Net View – TACAN Scheduler

The screenshot displays the AESOP 3.0 Net View – TACAN Scheduler interface. The main window shows a map of the LANTFLT region with various TACAN assignments marked. A 'TACAN Assignments' dialog box is open, listing platforms and their assigned TACAN IDs, channels, and dates. A 'Select TACAN Location' dialog box is also open, showing a list of cities and locations for selection. A 'System Restrictions' dialog box shows a table of TACAN system restrictions for various channels and frequencies.

TACAN Assignments

Platform Name	Number	TACAN ID	Channel	Start Date	End Date	OPAREA
ABRAHAM LINCOLN	CVN 72	BBY	1X	20110208	20110308	LITTLE CREEK
CURTS	FFG 98	SD	90X	20110208	20110308	YUDA
MOBILE BAY	CG 53	WY	39Y	20110208	20110308	LITTLE CREEK
MORMAN	DDG 92	GA	111X	20110208	20110308	LITTLE CREEK
RUSSELL	DDG 59	YY	201X	20110208	20110308	LITTLE CREEK
SHOAL	DDG 86	AH	100Y	20110208	20110308	LITTLE CREEK

TACAN OPAREAs

LANT TACAN Restrictions

Frequency	Channel	Status
962.00 MHz/1025.00 MHz	1X	
963.00 MHz/1026.00 MHz	2X	
964.00 MHz/1027.00 MHz	3X	
965.00 MHz/1028.00 MHz	4X	RESTRICTED
966.00 MHz/1029.00 MHz	5X	RESTRICTED
967.00 MHz/1030.00 MHz	6X	RESTRICTED
968.00 MHz/1031.00 MHz	7X	RESTRICTED
969.00 MHz/1032.00 MHz	8X	RESTRICTED
970.00 MHz/1033.00 MHz	9X	RESTRICTED
971.00 MHz/1034.00 MHz	10X	RESTRICTED

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AESOP 3.0 Common Operational Spectrum Report



AESOP 3.0 includes Joint Restricted Frequency List (JRFL) frequencies

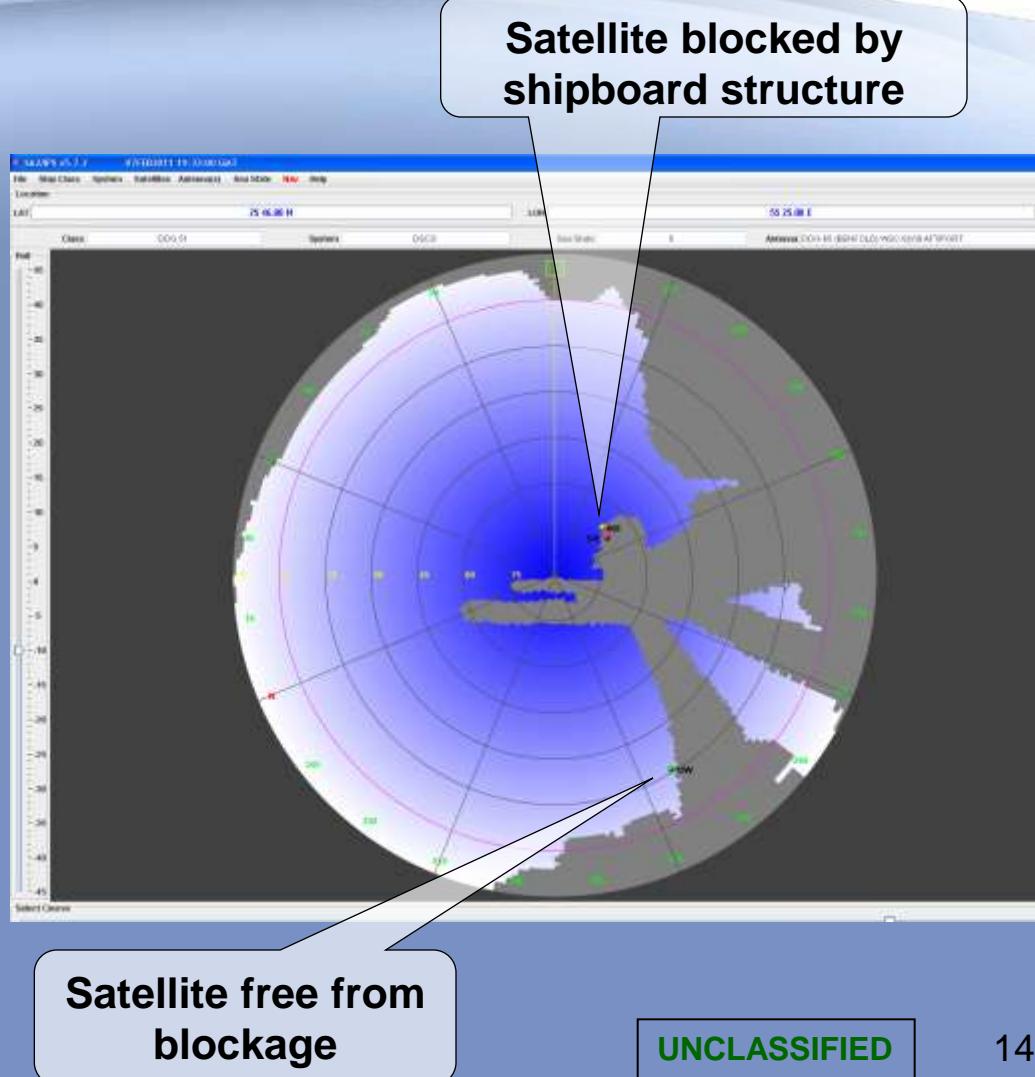
	A	B	C	D	E	F	G	H	I	J	K
1	UNCLASSIFIED										
2	NAVY JRFL FREQUENCIES										
3	Protection Code	Priority	Identifier	Description	Frequency	Status	Justification	Type			
4	Taboo	A1	LP157	BTB CHNL-13	156.65 MHz	Approved	International Taboo Frequency List	Net			
5	Taboo	A1	LP158	BTB CHNL-16	156.8 MHz	Approved	International Taboo Frequency List	Net			
6	Taboo	A1	ED651	INTL DISTRESS-CALLING	2183.4 kHz (2182)	Approved	International Taboo Frequency List	Net			
7	Taboo	A1	ED653	INTL AIR DISTRESS	121.5 MHz	Approved	International Taboo Frequency List	Net			
8	Taboo	A1	ED654	MIL AIR DISTRESS	243 MHz	Approved	International Taboo Frequency List	Net			
9	JOINT JRFL FREQUENCIES										
10	Protection Code	Priority	Identifier	Description	Frequency	Status	Justification	Type			
11	Taboo	A1		GMDSS/MET AND NAV WARNINGS	490 kHz	Approved	International Taboo Frequency List	ITFL			
12	Taboo	A1		GMDSS/NAVTEX/MET AND NAV WARNINGS	518 kHz	Approved	International Taboo Frequency List	ITFL			
13	Taboo	A1		INTL DISTRESS/SAFETY	2176 kHz	Approved	International Taboo Frequency List	ITFL			
14	Taboo	A1		INTERNATIONAL DISTRESS	2183.4 kHz	Approved	International Taboo Frequency List	ITFL			
15	Taboo	A1		INTL DISTRESS/SAFETY	2189 kHz	Approved	International Taboo Frequency List	ITFL			
16	Taboo	A1		INTERNATIONAL SAR	3024.4 kHz	Approved	International Taboo Frequency List	ITFL			
17	Taboo	A1		INTL DISTRESS/SAFETY	4126.4 kHz	Approved	International Taboo Frequency List	ITFL			
18	Taboo	A1		INTL DISTRESS/SAFETY	4179 kHz	Approved	International Taboo Frequency List	ITFL			
19	Taboo	A1		INTL DISTRESS/SAFETY	4209 kHz	Approved	International Taboo Frequency List	ITFL			
20	Taboo	A1		INTL MARITIME NAV SAFETY	4211.4 kHz	Approved	International Taboo Frequency List	ITFL			
21	Taboo	A1		GMDSS/NAVTEX MET AND NAV WARNINGS	4211.5 kHz	Approved	International Taboo Frequency List	ITFL			
22	Taboo	A1		INTERNATIONAL SAR	5581.4 kHz	Approved	International Taboo Frequency List	ITFL			
23	Taboo	A1		INTERNATIONAL DISTRESS SAFETY	6216.4 kHz	Approved	International Taboo Frequency List	ITFL			
24	Taboo	A1		INTL DISTRESS/SAFETY	6269.4 kHz	Approved	International Taboo Frequency List	ITFL			
25	Taboo	A1		INTL DISTRESS/SAFETY	6313.4 kHz	Approved	International Taboo Frequency List	ITFL			
26	Taboo	A1		INTL MARITIME SAFETY/GMDSS	6316 kHz	Approved	International Taboo Frequency List	ITFL			
27	Taboo	A1		INTL DISTRESS/SAFETY	8292.4 kHz	Approved	International Taboo Frequency List	ITFL			
28	Taboo	A1		INTL SAR/SURVIVAL CRAFT	8364 kHz	Approved	International Taboo Frequency List	ITFL			
29	Taboo	A1		INTL DISTRESS/SAFETY	8378 kHz	Approved	International Taboo Frequency List	ITFL			
30	Taboo	A1		INTL DISTRESS/SAFETY	8416 kHz	Approved	International Taboo Frequency List	ITFL			
31	Taboo	A1		GMDSS/INTL MARITIME SAFETY	8418.5 kHz	Approved	International Taboo Frequency List	ITFL			
32	Taboo	A1		INTL DISTRESS/SAFETY	12291.4 kHz	Approved	International Taboo Frequency List	ITFL			
33	Taboo	A1		INTL DISTRESS/SAFETY	12521.4 kHz	Approved	International Taboo Frequency List	ITFL			
34	Taboo	A1		INTL DISTRESS/SAFETY	12578.4 kHz	Approved	International Taboo Frequency List	ITFL			
35	Taboo	A1		GMDSS/INTL NAVIGATION SAFETY	12581 kHz	Approved	International Taboo Frequency List	ITFL			
36	Taboo	A1		INTL DISTRESS/SAFETY	16421.4 kHz	Approved	International Taboo Frequency List	ITFL			
37	Taboo	A1		INTL DISTRESS/SAFETY	16696.4 kHz	Approved	International Taboo Frequency List	ITFL			
38	Taboo	A1		INTL DISTRESS/SAFETY	16806 kHz	Approved	International Taboo Frequency List	ITFL			
39	Taboo	A1		GMDSS/INTL MARITIME SAFETY	16808.5 kHz	Approved	International Taboo Frequency List	ITFL			
40	Taboo	A1		GMDSS/INTL MARITIME SAFETY	19682.5 kHz	Approved	International Taboo Frequency List	ITFL			
41	Taboo	A1		GMDSS/INTL MARITIME SAFETY	22378 kHz	Approved	International Taboo Frequency List	ITFL			
42	Taboo	A1		GMDSS/INTL MARITIME SAFETY	26102.5 kHz	Approved	International Taboo Frequency List	ITFL			
43	Taboo	A1		INTL DISTRESS/AERONAUTICAL EMERGENCY	121.5 MHz	Approved	International Taboo Frequency List	ITFL			
44	Taboo	A1		INTL DISTRESS/AERONAUTICAL EMERGENCY	123.1 MHz	Approved	International Taboo Frequency List	ITFL			
45	Taboo	A1		INTL SHIP/AIRCRAFT SAR	156.3 MHz	Approved	International Taboo Frequency List	ITFL			

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Satellite Availability & Analysis (SA2)

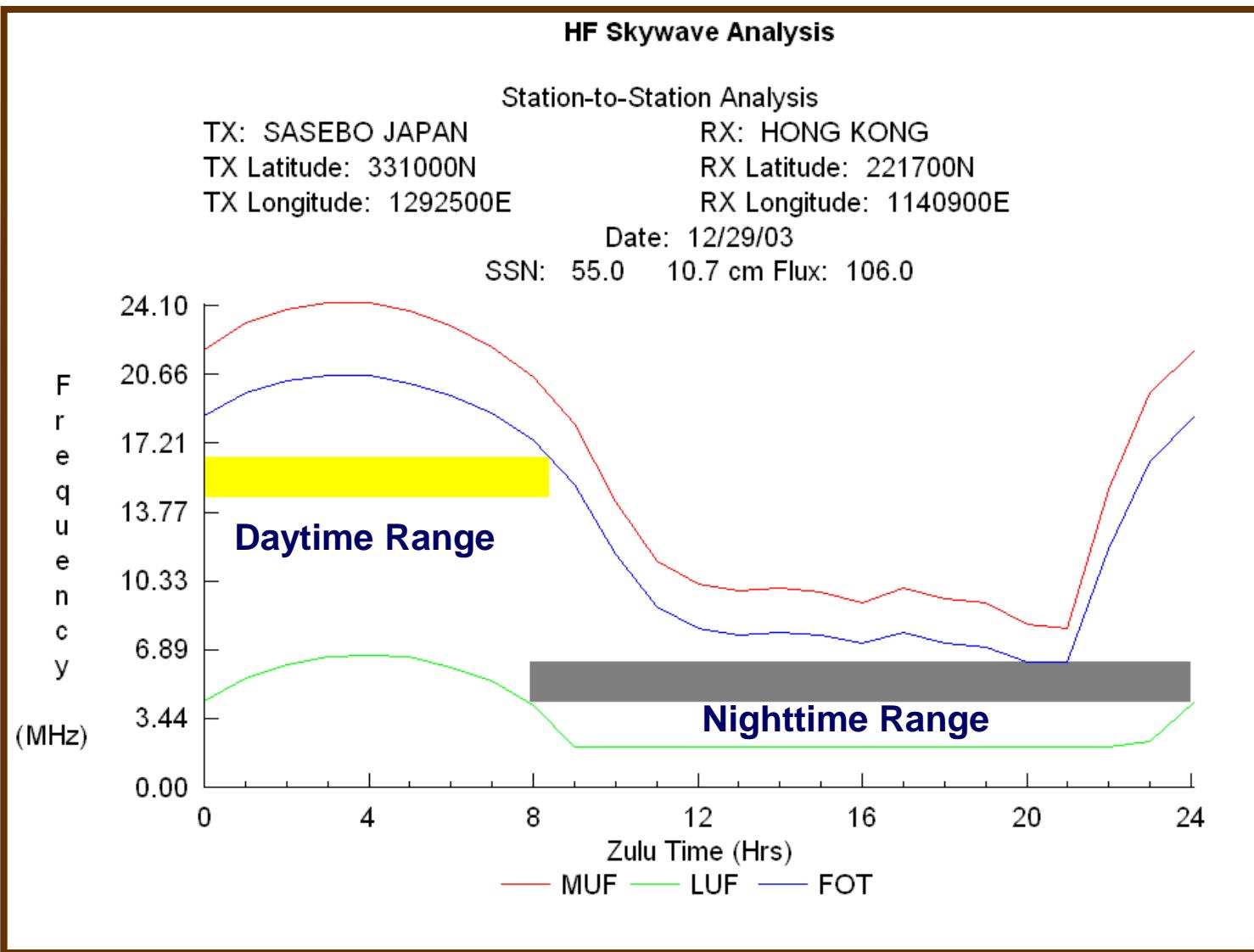
- ✓ AESOP 3.0 – SA2 v5.7.2
- ✓ Software application – situational awareness for SATCOM operators
- ✓ Shows locations of satellites
- ✓ Shows relation of satellites to shipboard structures (masts, cranes, deckhouses, and other antennas)
- ✓ Shows Line Of Sight (LOS) blockage



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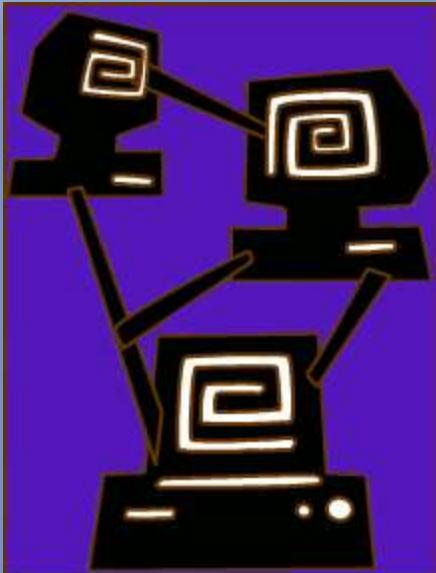
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HF Skywave Analysis



Standard Frequency Action Format (SFAF)

Standard Spectrum Resource Format (SSRF)



- ✓ Joint Interoperability Requirement
- ✓ MCEB Pub 7 (SFAF)
- ✓ MCEB Pub 8 (SSRF)
 - Version 2.0.1 (1 July 2010)
 - Tactical Information - JRFL
- ✓ Standard for DoD Import and Export of Frequency Management Information
 - Government, Civilian, Other DoD Systems
 - Area Frequency Coordinator (AFC)
 - Joint Task Force Commander

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AESOP 3.0 Outputs

Messages

- Communications Planning:
 - Frequency Request
 - OPTASK COMM Plan
 - (XML or GENADMIN)
- Radar Planning:
 - Request
 - Assignment
- Participant:
 - Reply (XML or GENADMIN)
- **TACAN Assignment and Periodic**
(SFAF or GENADMIN)
- **JRFL Message (XML – MCEB PUB 8)**

Graphical Displays

- Planning Board View – EMI and Net Connectivity
- Spectrum Occupancy View
- Spectrum Display
- Radar Coverage Plot
- HF SkyWave Analysis
- SA2

Reports

- **Common Operational Spectrum**
- Assignments
- Comm Nets
- Electromagnetic Environment
- EMI Victims & Interactions
- Engineering Analysis
- Guard Requirements
- IMI Analysis
- Inventory
- Net Prioritization
- Participants
- Phase
- Platform Equipment Inventory
- Platform Position
- Restriction
- Radar and Comm Plans in SFAF
- Spectrum Use
- System Characteristics

Future Plans - AESOP 4.0

- ✓ MCEB Pub 8 XML Compliance.
 - 3.0 JRFL output already complies with Pub 8.
 - Current SFAF output will be available in Pub 8 format.
- ✓ Net-Centric Application.
 - Web-enabled, thick-client application.
 - Remotely-located database allowing collaboration.
 - Master AESOP database will be deployed ashore, accessible via SIPRNET.
 - AESOP's stand-alone capability will be retained for users without SIPRNET or with limited bandwidth capability.

More Future Plans - AESOP 4.0

✓ Improved Antenna Modeling

- For improved analysis and visualization capabilities.
- Users will be able to view and use 2D and 3D antenna pattern data from the database.

✓ System Operational Effectiveness Visualization

- Enhanced radar coverage plots
 - The effects of EMI on target detection,
 - Show a multi-sensor coverage area,
 - Provide a 3D view of radar coverage.
 - Coverage plots for other systems types (communication, NAVAID, and EW) in the presence of EMI.

✓ Automated Spectrum Analyzer Interface

- Interface with a spectrum analyzer
- Observed signals will be displayed on AESOP's Spectrum Display
- Will allow comparison of planned spectrum use to actual RF environment.

AESOP 3.0 Highlights



Questions?

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U.S. Navy Compliance



AESOP Version 2.1/3.0

- ✓ System Security Authorization Agreement (SSAA) and Authority To Operate (ATO), 14 APRIL 2009
- ✓ Department of Navy Application and Database Management System (DADMS)
 - 52038
- ✓ Navy-Marine Corps Intranet (NMCI)
 - RFS-106579
 - ISF-117477
- ✓ Information Technology for the 21st Century (IT-21)
 - PSC-2009-00076
- ✓ Naval Education and Training Command (NETC) Training Network (TRANET)
 - NETC_N00076_TRANET-C_S
 - NETC_N00076_TRANET_U
- ✓ OCONUS Navy Enterprise Network (ONE-NET)
 - Reference DADMS Number 52038 when calling the ONE-NET Help Desk for installation.

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